Effects of the anthropogenics pressures (marine litter) on the coastal ecosystems of the Marine Reserve "Isla de La Graciosa e islotes del norte de Lanzarote"

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Abstract

The European Marine Strategy Framework Directive (2008/56/EC) considers marine litter as one of its environmental descriptors, requiring the development and standardization of criteria and methodologies for its use to test the good environmental status of marine conditions. The assessment of the impact caused by litter accumulation in the shoreline lacked specific monitoring planning and had not been systematically performed to date in Canary Islands.

During the project "Evaluation of the effect of the anthropogenic pressures (marine litter in beaches and alteration of shallow seabed by boats anchoring) on the coastal ecosystems of the "Marine Reserve of Isla de La Graciosa e islotes del norte de Lanzarote (MRLG)" developed with the financial help of the Canary Islands Government (Council of Agriculture, Ranching, Fishing and Waters), two surveys were carried out, "LA GRACIOSA 1310" and "LA GRACIOSA 1311", both developed at MRLG and its vicinities. The aim has been to depict MRLG shoreline and to locate marine litter accumulation points the most, contributing with some tools to assess and manage the coastal ecosystems of the marine reserve.

Total shoreline sampled at both surveys together was 38326 m, 1834 m at Alegranza, 1366 m at Montaña Clara, 24656 m at La Graciosa Island, and the rest, 10470 m, at the Lanzarote's shoreline portion bathed by MRLG waters. Shoreline sampling was made qualitatively sorting the sampling stations, according to litter presence and distribution, by means of a upward numerical coding related to the type of waste or garbage found. Moreover, each station was additionally depicted according to the type of substrate as well as to the prevailing type of waste, defining what we named "transects".

To validate methodology to European standards, a more exhaustive experimental sampling was made in four transects identified as high density or high concentration of marine litter, following guidelines of a method developed for OSPAR maritime area during the first half of 2000 decade (OSPAR, 2007). It involves evaluating the possibilities and needs of adjustment of this methodology to the particular conditions of our region (González, et al., 2013 a and b).

As preliminary results, the spatial distribution of garbage coastal accumulation will be shown in a cartographic base, expressed as relative abundance by island, according to a 4 degrees scale (no litter, low, medium and high litter presence) and according to the dominant kind of garbage in each transect. An example with one of the most densely occupied with trash transects is shown to illustrate a sampling method without the requirement of trash collection. This method uses a sampling unit of 1x1 m grid, divided in 10x10 cm subgrids. This grid is set parallel to sampling direction repeatedly. Distance between grids is determined by a randomizing software. Sampling direction zigzags from sea border to beach back shore, making 45° degrees angles. Subgrids occupied by trash are counted once the grid is set. Waste is depict and identified following a guide developed for this purpose by OSPAR in 2010.